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## Geographic tongue – a review of contemporary literature and a case study

### Język geograficzny – przegląd współczesnego piśmiennictwa i opis przypadku

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#### Abstract

Benign migratory glossitis (BMG) is a disorder defined under various names such as geographic tongue or glossitis areata exfoliativa. It is a condition which primarily affects the dorsal part of the tongue. The disease has a tendency towards remissions and relapses, which may occur in the same or different areas. The clinical presentation of the condition resembles a map. The aim of this paper is to describe the clinical presentation of geographic tongue, as well as presenting the current view on the aetiology of the condition on the basis of contemporary literature and a case study.

**Keywords:** geographic tongue, benign migratory glossitis (BMG), glossitis areata exfoliativa, tongue diseases, glossitis.

#### Streszczenie

Łagodne wędrujące zapalenie języka (BMG) jest schorzeniem znanym pod różnymi nazwami, takimi jak: język geograficzny czy brzeżne złuszczone zapalenie języka. Jest stanem, który w szczególności dotyczy grzbietowej części języka. Choroba ma tendencje do remisji i nawrotów, które mogą pojawić się w tych samych lub innych miejscach. Wyglądem swoim przypomina mapę. Celem pracy jest opis obrazu klinicznego języka geograficznego, prezentacja obecnego spojrzenia na etiologię na podstawie współczesnego piśmiennictwa oraz opis przypadku.

**Słowa kluczowe:** język geograficzny, łagodne wędrujące zapalenie języka, brzeżne złuszczone zapalenie języka, choroby języka, zapalenie języka.

#### Introduction

Geographic tongue is a benign, often asymptomatic type of glossitis which is recurrent in character. It has a tendency for familial occurrence and may appear at any age. Its characteristic symptom is a migrating changeable clinical presentation resembling a map. The condition was first described in 1831 by Rayer [1].

#### Epidemiology

According to different authors, the prevalence rate of geographic tongue in a population ranges between 0.28% and 14.4% [2–6], but the majority of sources indicate a range of 1.0 – 2.5% [1, 3, 7, 8]. Gender bias, however, is debatable. Some authors report a higher prevalence in women [2, 3, 5, 7, 9, 10], whereas others emphasize a lack of gender correlation [1, 2, 11]. It seems that the condition most frequently affects children [12, 13] and young adults [13], although it can occur at any age [11].

#### Aetiology

There is no agreement on the aetiology of the condition among scientists. However, a correlation

between the occurrence of geographical tongue and some diseases has been proven. The most frequently mentioned diseases and other associated factors include the following:

- psoriasis [2–4, 7–9, 14–20], especially its pustular type [2, 19].
- allergy and atopy [2–4, 8, 16, 18, 21, 22]
- asthma [2, 7, 21, 22]
- genetic and developmental backgrounds of a polygenic inheritance type [2–4, 7, 9, 13]
- stress and psychological factors [2, 4, 7, 9, 13]
- hormonal disturbances [2, 7, 9, 23]
- oral contraceptive use [2, 7, 8]
- juvenile diabetes mellitus [2, 4, 7, 9, 13]
- tendency to develop immunological diseases [9]
- vitamin and nutritional deficiencies [2, 7, 13]
- gastric disorders [7, 9, 13]
- Down's syndrome [2, 7]
- Reiter's syndrome [2, 7]
- fissured tongue [2, 4, 7]
- lichen planus [2]
- lithium therapy [2, 7]
- Aarskog syndrome [2]
- fetal hydantoin syndrome [2]

## Symptoms

Lingua geografica is most often present on the front two-thirds of the dorsal or lateral surfaces of the tongue [1–5, 7, 9, 10–12, 14, 16, 19, 21, 23–25]. The lesions sometimes extend to the ventral surface of the tongue [7, 11]. The condition is caused by exfoliation of filiform papillae and the overlying keratine leading to the formation of polycyclic, serpiginous, erosion like lesions, bordered by slightly elevated yellowish-white margins [2, 8, 9, 13, 19, 23, 24]. The lesions may vary in colour from pink to red and are affected by a loss of filiform papillae, which slide down to the rim of the lesions. These patches are characterized by a decreased number of taste buds. The fungiform papillae either remain unchanged or are red and swollen [3, 8–10, 12, 13]. Another characteristic feature is a changeable clinical presentation with a typical map-like appearance (geographic tongue) [9, 12, 22]. The lesions have a tendency to change shape and migrate over time. The condition may change from day to day, coalescing, increasing, changing shape, or disappearing in one spot only to appear in another [10, 12, 19, 23]. Another variable are periods of remission and exacerbation [9]. A relapse can occur in the same locations even several years after the appearance of the initial lesion [16]. The lesions heal of their own accord without any residual scar formation [9].

Usually there are no symptoms. Some patients, however, complain of hypersensitivity to spicy, acidic, and salty foods. Others report a burning sensation in the oral cavity and a tenderness caused by cigarette smoke [3, 5, 7–9, 12, 16, 18, 22, 23, 25].

## Microscope image

At the outer borders of the lesions neutrophil infiltrations with microabscesses, leukocyte invasion into the subepithelial layer as well as swelling, rupture of cell junction, glycogen deposits and exfoliation of necrotic cells in the surface layers of epithelium can be observed. In the erythematous areas acanthosis (thickening of the stratum spinosum), thinning of the granular layer and an incomplete keratinization in the surface layer of the epithelium can be noticed [2, 3, 5, 12, 16].

## Diagnosis and differential diagnosis

The diagnosis is based upon the clinical presentation and history. It is usually easy to make and rarely requires histopathological confirmation [16]. Routine laboratory tests including blood tests, the erythrocyte sedimentation rate, as well as levels of C-reactive protein and glucose, are usually within normal ranges. However, it is necessary to distinguish those symptoms from the symptoms of anaemia, which is similarly manifested in the oral cavity [2, 11]. On the basis of the frequently migrating pattern of the lesions typical for this disease, according to Górska [12], it is desirable to re-exa-

mine the patient after a few days to confirm the diagnosis.

Geographic tongue should be differentiated from patches of lichen planus, leukoplakia, candidiasis, lupus erythematosus, HSV infection, and drug reaction. Additionally, in children, differential diagnosis should also include local trauma and severe neutropenia [2, 7, 9, 12, 17, 19].

## Treatment

The disease does not usually require treatment [8, 12]. Topical treatment includes the use of anti-inflammatory agent with corticosteroids, anesthetics as well as protective and coating herbal rinses [2, 12, 14, 16]. Additionally, the treatment might also include the usage of antihistaminics, anxiolytics and sedatives [2, 11]. Partial improvement can also be observed after vitamin A, B, and C therapy [2, 26] as well as after changes in diet [12].

## Case study

B.Ż., a 32-year-old female, came for consultation about lesions on her tongue (**Figure 1**). The patient reported the changes had first appeared when she was around 19 years old. They had remained asymptomatic for many years. The only sign of discomfort was a sensation of thinning out after the consumption of milk drinks. Anamnesis revealed asthma, atopic dermatitis as well as allergy to pollen, grass, dust and animal fur. The patient also reported hormonal disturbances (polycystic ovarian syndrome, hirsutism) and gastric disorders (irritable bowel syndrome). In the past she had a vaginal fungal infection, which was not related to antibiotic therapy, and anaemia. The patient also mentioned situations of extreme distress. Blood tests showed a high level of eosinophilia, immunoglobulins E and prolactins.

Extraoral clinical tests revealed atopic skin, excessive facial hair, and displacement of the sebaceous glands into the red lip area resembling Fordyce disease in appearance (**Figure 2**). Intraoral examination showed the typical clinical presentation of geographic tongue with areas of atrophic filiform papillae and a slight redness on the front of the dorsal surface of the tongue. Furthermore, the tongue was covered with a yellow-white coating. In order to exclude fungal infection a mycological swab was commissioned. The test eliminated the presence of *Candida* spp.

## Summary

In view of the multifactorial aetiology of geographic tongue it is necessary to systematize the findings of conflicting reports and verify the hypotheses in order to achieve a better understanding of the pathophysiological mechanisms of the disease. The available literature still provides ambiguous information. Improved knowledge could help to find new, more effective therapeutic options.



**Figure 1.** Erythematous patches on the dorsal part of the tongue

**Rycina 1.** Plamy rumieniowe na grzbietowej części języka



**Figure 2.** Displacement of the sebaceous glands

**Rycina 2.** Przemieszczenie gruczołów łojowych

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